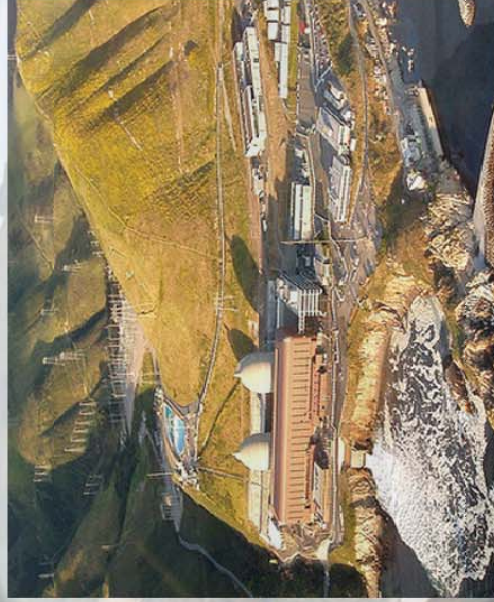


Bechtel Power JUOTC Progress Report

June 20, 2012



Bechtel Confidential & Proprietary

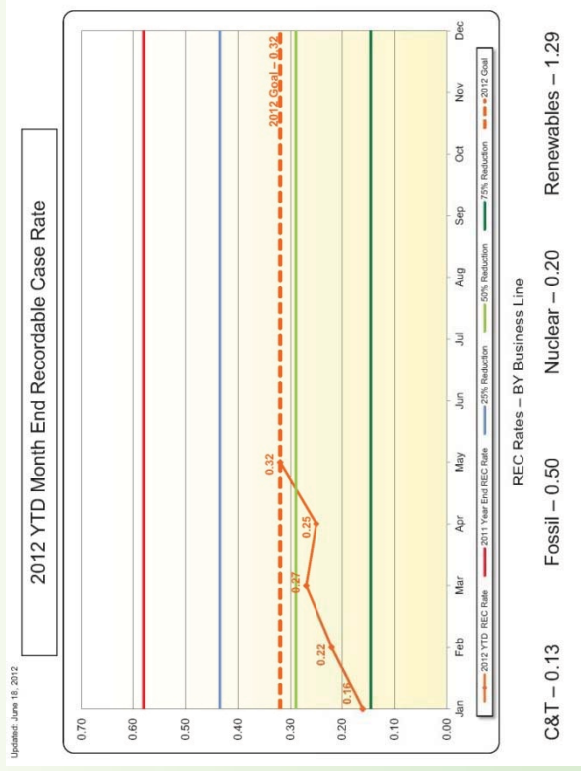
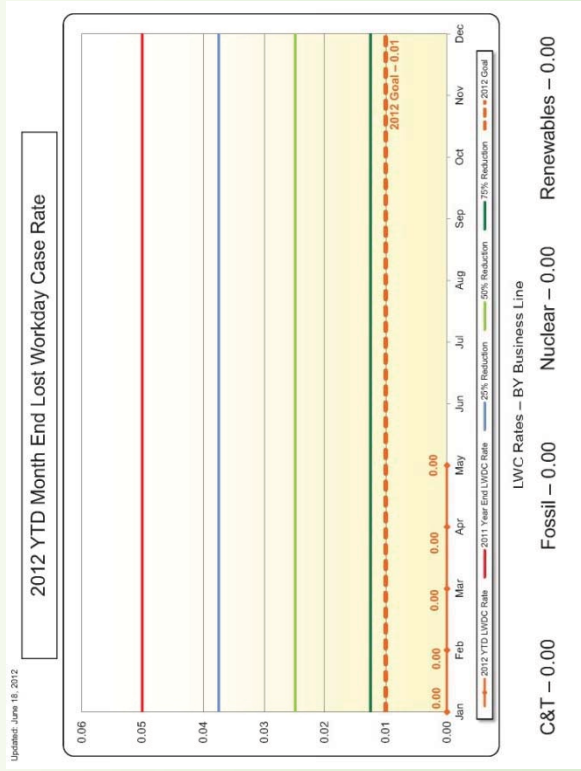
Agenda

	<u>Minutes</u>
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Safety — A Core Value

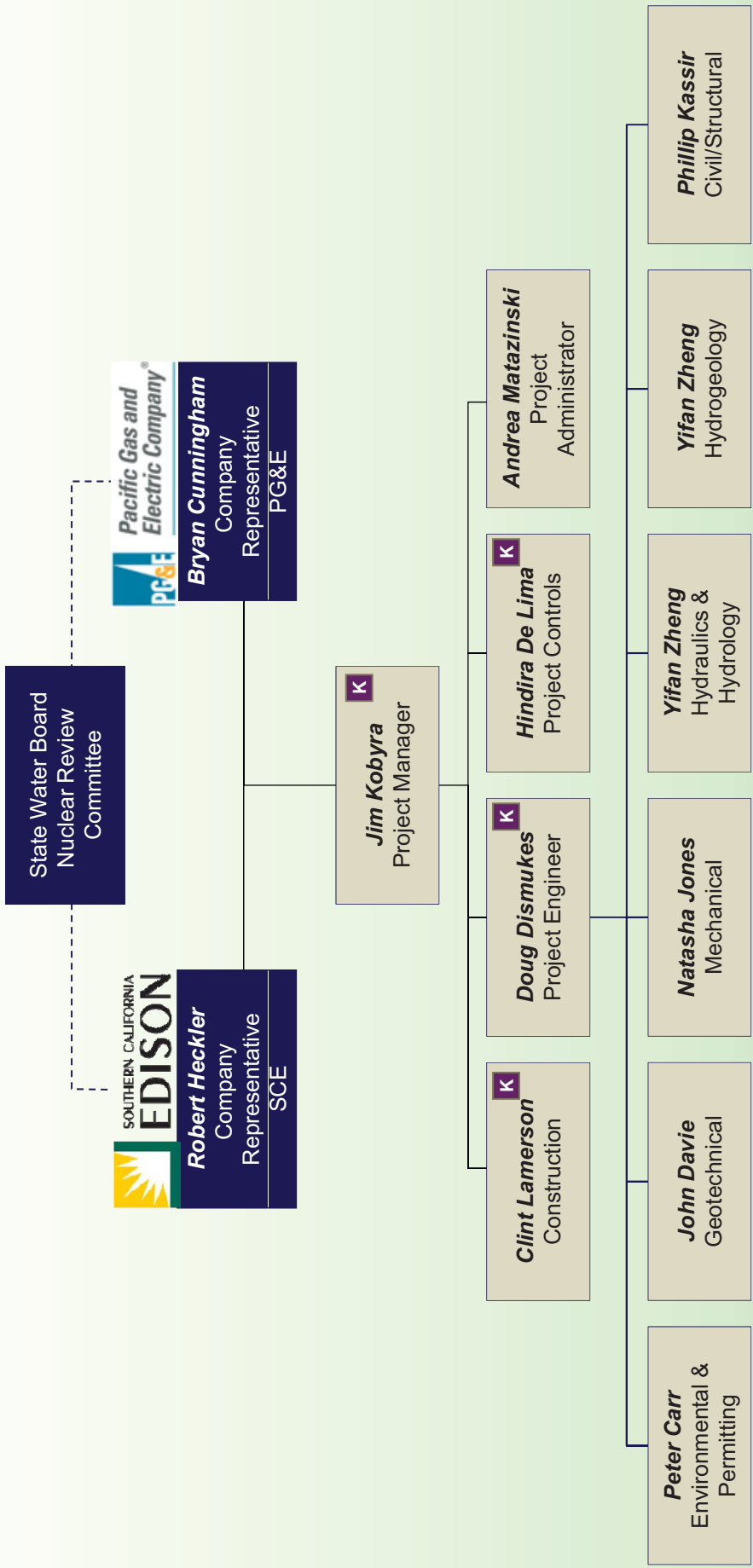
Bechtel
One of the world's most experienced builders and safest contractors



Over 24,000,000 hours worked, AND COUNTING, in the Power Business Unit without a lost-time accident



Bechtel JUOTC Project Organization



Depth of Resources — JUOTC Team

Name	Discipline	Years Experience
Y. Zheng	Hydraulics & Hydrology	25
M. Naghash	Hydraulics & Hydrology	29
K. Ng	Hydraulics & Hydrology	22
L. Young	Hydrogeology	33
G. Day	Hydrogeology	27
J. Davie	Geotechnical	42
N. Jones	Mechanical	8
R. Tawney	Mechanical	35
T. Murray	Mechanical	16
P. Carr	Environmental	32
P. Wan	Environmental	40+
M. Golden	Environmental	27
C. Lamerson	Construction	40+
P. Kassir	Civil/Structural	15



Project Progress

**INSERT PAGE 1 OF SCHEDULE
11 X 17**



Project Progress (cont.)

**INSERT PAGE 2 OF SCHEDULE
11 X 17**



Accomplishments

- Phase 1 project team assembled and functioning since April 1
- Issued progress reports
- Developed criteria for review of alternative technologies
- Contacted the majority of regulatory agencies
- Received technical input from cooling tower suppliers
- Completed "Set A" criteria reviews
- Individual technology report development in progress



Details of Review

Process Overview



Details of Review (cont.)

**INSERT FLOWCHART
11 X 17**

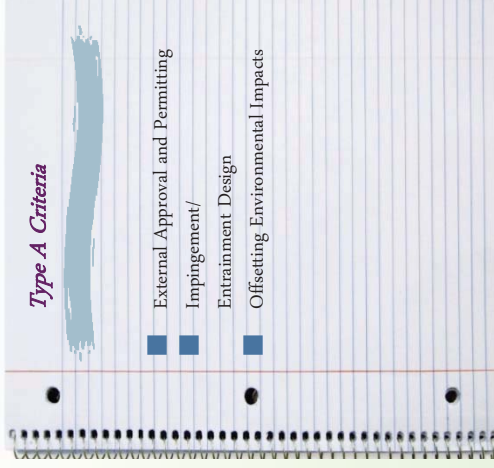


Details of Review Review Criteria

- **Criteria Set A and Criteria Set B**
 - Prioritized approach for alternative technology reviews
 - Type A criteria most likely to have a fatal flaw



Details of Review Type A Criteria



- **External approval and permitting (nonnuclear licensing)**
 - Is the technology permitable in the state of California, assessing possible permitting constraints and site-specific topographic and areal constraints?
 - Is the permitting process for the technology sufficiently complex to effectively preclude completion?

■ **Impingement/entrainment design**

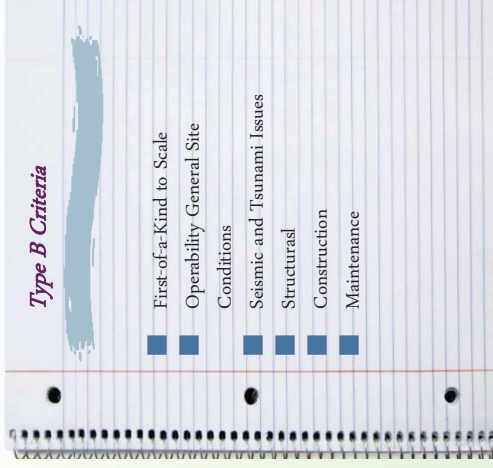
- Will the impingement/entrainment design satisfy the 316b California Once Through Cooling Policy Phase II rules?
- Is the thru slot/thru screen velocity less than 0.5 fps?
- Does the screen mesh size or slot opening sufficient fine in reducing the entrainment? Does this reduction meet the Track II criteria regarding its comparable performance against the closed cooling cycle option?
- Has a fish collection/return system provided at the traveling screens?
- Are the locations of intake properly selected, i.e., are they in less biologically rich area (out of the littoral zone)? Has screen material been properly selected to counter biofouling in a marine environment?

Type A Criteria (cont.)

- **Offsetting environmental impacts**
 - Will the cooling system technology create additional environmental or detrimental impacts considering cooling tower plume aesthetics, drift-related particulate emissions and salt deposition, land availability, coastal impact, disruption of marine habitat, dredging and spoil disposal, soil erosion and sedimentation, greenhouse gas emission increase, noise impacts, effluent discharge impacts (thermal, TDS), freshwater or groundwater use?

Details of Review

Type B Criteria



■ First-of-a-kind to scale

- Has the technology been used in existing or past nuclear power projects in the United States and other parts of the world?
- Has the technology been used in any existing or past projects in the United States and other parts of the world?
- Is the size of the application applicable to the two sites?
- Has the technology been used on sites with similar physical characteristics to Diablo Canyon and SONGS?
- Is it technically justifiable to scale up the technology based on known data?
- Is the technology commercially obtainable?

Type B Criteria (cont.)

■ Operability general site conditions

- Will the technology fit into the existing circulating water system?
- Will the technology result in exceedance of maximum allowable temperatures, alarm, and/or trip points?
- Will the impacts to the plant operations result in unacceptable operation issues, with respect to the pumps, valves, condenser, and other cooling equipment?
- Will the increased debris loading issues be acceptable/manageable if retrofitted to fine mesh screens?
- Will the increased differential pressure across screens acceptable if retrofitted to fine mesh screens or wedge wire screens?
- Will the technology fit into the existing footprint of the site?
- Will the technology successfully operate under site environmental conditions?
- Is the technology applicable considering the water conditions and availability at the site?

Type B Criteria (cont.)

- **Seismic and tsunami issues (engineering)**
 - Can the technology be properly designed for seismic requirements?
 - Is the site selection for the technology subject to unacceptable tsunami flooding and other external flooding events?
- **Structural**
 - Can the structure for the technology in question be properly designed against critical loadings imposed on them?
 - Are there unacceptable impacts to the existing structures?
- **Construction**
 - Is the technology in question constructible based on current-day construction methods, practices, and knowledge?
 - What are the installation details necessary to determine that fabrication, required access, and availability of space for the installation and staging activities, and associated physical modifications can be accomplished?

Type B Criteria (cont.)

- **Maintenance**
 - What are the expected maintenance activities for the technology?
 - Have the maintenance activities been fully identified that could create a personnel hazard, and/or unrealistic (noncommercially viable) operational maintainability burden? Debris handling?
 - Are there corrosion or incrustation issues that may result in unrealistically frequent maintenance of the technology?

Determination of Serious Flaws

- **Flaws resulting in a "feasible" determination for Phase 1**
 - Not meeting Track 1 requirements
 - Meeting impingement objectives but not entrainment
 - Regulatory agency comments regarding any positive improvement will be considered
 - Permitting time frame(s)

- **Serious flaws resulting in a "not feasible" determination**
 - Technology cannot attain the Track 2 intake velocity <0.5 ft/sec
 - Land use significantly changes the area's topography
 - Plant output de-rated requiring additional capacity to maintain grid reliability

Preliminary Results

Not Reviewed
Feasible
Not Feasible
Not Complete

Criterion	1	2	3	4	5	6	7	8	9
Alternative Technology	External Approval & Permitting	Impingement Entrainment	Offsetting Environ Impacts	FOAK to Scale	Operability General Site Conditions	Seismic & Tsunami issues	Structural	Construction	Maintenance
1	Closed Cycle Clg Systems								
	Salt Water Source	SONGS DCPP							
	Fresh Water Source								
	Reclaim Water Source								
1a	Passive Draft Dry System								
1b	Mech Draft Dry								
1c	Hybrid Wet / Dry Clg Systems								
1d	Wet Natural Draft								
1c	Wet Mechanical Draft								
1d	Freshwater from off site								
1e	Reclaimed Water from off site								
2	Inshore Mech Fine mesh								
3	Offshore Modular Wedgewire								
4	Intake relocation	SONGS							
5	Deep water Offshore intake								
6	Variable Speed Pumping				SONGS DCPP				
7	Source Water Substrate								
7a	Shoreline								
7b	Benthic								
8	Operational Strategies								



Report Review Process

- Bechtel will issue draft reports for each technology to each utility
- Each utility will immediately forward each report to the Review Committee for review
- The committee and utilities will coordinate and provide Bechtel with one set of comments using the Comment form
- The schedule is based on 2 week turnaround.
- Bechtel will coordinate with those providing comments for resolution
- Bechtel will issue the revised report



Comment Review Form

COMMENT RESOLUTION FORM

Page 1 of ___

Project: JUOTC Job No.: 25761/25762 Site: N/A

Report: _____

 Rev. No.: _____

Reference: _____

Item No.	Comment & Commenter	Resolution

Responsible Engineer: _____ Date: _____
 Checker: _____ Date: _____
 Engineering Group Supervisor: _____ Date: _____



Key Issues

- Closed cycle cooling is the only means to comply with California OTC Policy Track 1 criteria
- California Track 2 impingement criteria is attainable (< 0.5 ft/sec)
- Entrainment can be improved but not meet the California Track 2 90% reduction criteria
- Key regulatory agencies unable to provide tangible guidance regarding ability to permit or time frames to obtain permits to screen out a technology

Open Items

- Practical time frames for regulatory agency(ies) permitting
- Practicality of hyperbolic natural draft towers on California's coastline
- Sources of reclaim water for closed cycle cooling systems
- Availability of fresh water for closed cycle cooling systems
- Internal Bechtel reviews of draft reports
- Transition to Phase 2
 - Nuclear Review Committee concurrence to proceed to Criteria #10 and #11



Questions

